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European core curriculum in cariology for undergraduate dental students

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Abstract: As dental caries prevalence is still high in many populations and groups of both children and adults worldwide, and as caries continues to be responsible for significant health, social and economic impacts, there is an urgent need for dental students to receive a systematic education in cariology based upon current best evidence. Although European curriculum guidelines for undergraduate students have been prepared in other dental fields over the last decade, none exist for cariology. Thus the European Organisation for Caries Research (ORCA) formed a task force to work with the Association of Dental Education in Europe (ADEE) on a European Core Curriculum in Cariology. In 2010, a workshop to develop such a curriculum was organised in Berlin, Germany, with 75 participants from 24 European and 3 North-South American countries. The Curriculum was debated by five pre-identified working groups: I The Knowledge Base; II Risk Assessment, Diagnosis and Synthesis; III Decision-making and Preventive Non-surgical Therapy; IV Decision-making and Surgical Therapy; and V Evidence-based Cariology in Clinical and Public Health Practice and then finalised jointly by the group chairs. According to this Curriculum, on graduation, a dentist must be competent at applying knowledge and understanding of the biological, medical, basic and applied clinical sciences in order to recognise caries and make decisions about its prevention and management in individuals and populations. This document, which presents several major and numerous supporting competences, does not confine itself to dental caries alone, but refers also to dental erosion/non-erosive wear and other dental hard tissue disorders.

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EUROPEAN CORE CURRICULUM IN CARIOLOGY FOR UNDERGRADUATE DENTAL STUDENTS

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Introduction

Worldwide, the prevalence of dental caries among adults is high as the disease affects nearly 100% of the adult population in the majority of countries (Petersen et al. 2005a). Furthermore, in most countries, dental caries still affects up to 90% of school-aged children. Thus, it is not surprising that the World Health Organisation calls for actions for continuous improvement in oral and dental health (Petersen et al. 2005b). For centuries, the main task of dentists has consisted of administering therapies for the consequences of the carious destruction of dental hard tissues. Only in the last decades has it been accepted by the dental profession that application of caries preventive measures in patients and populations also represents an important part of dental activities. All these aspects show that there is a need for dental students to receive a systematic and profound education in cariology. In Europe, the Association of Dental Education in Europe (ADEE) prepared the document „Profiles and Competences of a European Dentist“ (Plasschaert et al. 2005) which describes primarily the general competences a dentist should have. It is the task of the various dental disciplines to formulate their own specific curriculum for the education of dental students. With regard to the education of undergraduate dental students, in various dental fields European curriculum guidelines have been prepared over the last decade but not for cariology (ESE 2001, EAPD 2009, Hicklin et al. 2009, Kossiani et al. 2009, Sanz et Meyle 2010).

Thus, in 2006, the European Organisation for Caries Research (ORCA) decided to form a task force to work on a European Core Curriculum for Cariology for undergraduate students. The members of this group were in alphabetical order Ben Amaechi, Wolfgang Buchalla, Marie-Charlotte Huysmans, Nigel Pitts, Fabio Sampaio and Andreas Schulte. This group was reinforced in 2009 by the ORCA board member Christian Splieth and the ADEE representative George Vougiouklakis because ORCA and ADEE had agreed to cooperate on this project. The cariology curriculum group developed a questionnaire which was sent in 2009 to all European Dental Schools which are members of ADEE (n=170). The most important finding was that 90% of the responding 123 Dental Schools supported the idea of developing a European Core Curriculum in Cariology (Schulte et al. 2011). In 2010, a workshop on the development of a European Core Curriculum for Cariology was organised in Berlin, Germany, with 75 invited participants from 24 European and 3 countries from North and South America. The most important items for the European Core Curriculum for Cariology were identified and debated by five working groups (see below). The chairs of these five working groups were authorized to use the consensus papers agreed on at the workshop, to write the Cariology Core Curriculum document which is presented hereafter. This document was finalized by undergoing a thorough reviewing process through the co-chairs and rapporteurs of these five working groups, representing many countries across Europe.

Very soon it became clear that the term “cariology” does not necessarily include all aspects of dental hard tissue disorders such as dental erosion and non-erosive wear.

Nevertheless, this curriculum does not confine itself to the aetiology, prevention and therapy of dental caries alone, but refers also to dental erosion and non-erosive wear. In most countries, the term cariology has been used in variable ways to name departments in dental schools, lectures and courses and specific examinations. The answers on the above mentioned questionnaires revealed that in nearly every dental school the unit(s) responsible for cariology are also in charge of the education in dental erosion and non-erosive wear. To date, no significant and short term to describe all aspects of dental hard tissue disorders with caries included has been identified. Thus, throughout this document the curriculum relates to caries, dental erosion, non-erosive wear and other dental hard tissue disorders.

The present document is structured from the general to the more specific for every section. Five domains (listed below and presented in Figure 1) have been identified representing the broad categories of cariology that were felt by the planning committee to be needed by a modern dentist graduating in Europe at the beginning of the 21st century.

- I. The Knowledge Base
- II. Risk Assessment, Diagnosis and Synthesis
- III. Decision-Making and Preventive Non-surgical Therapy
- IV. Decision-making and Surgical Therapy
- V. Evidence-based Cariology in Clinical and Public Health Practice

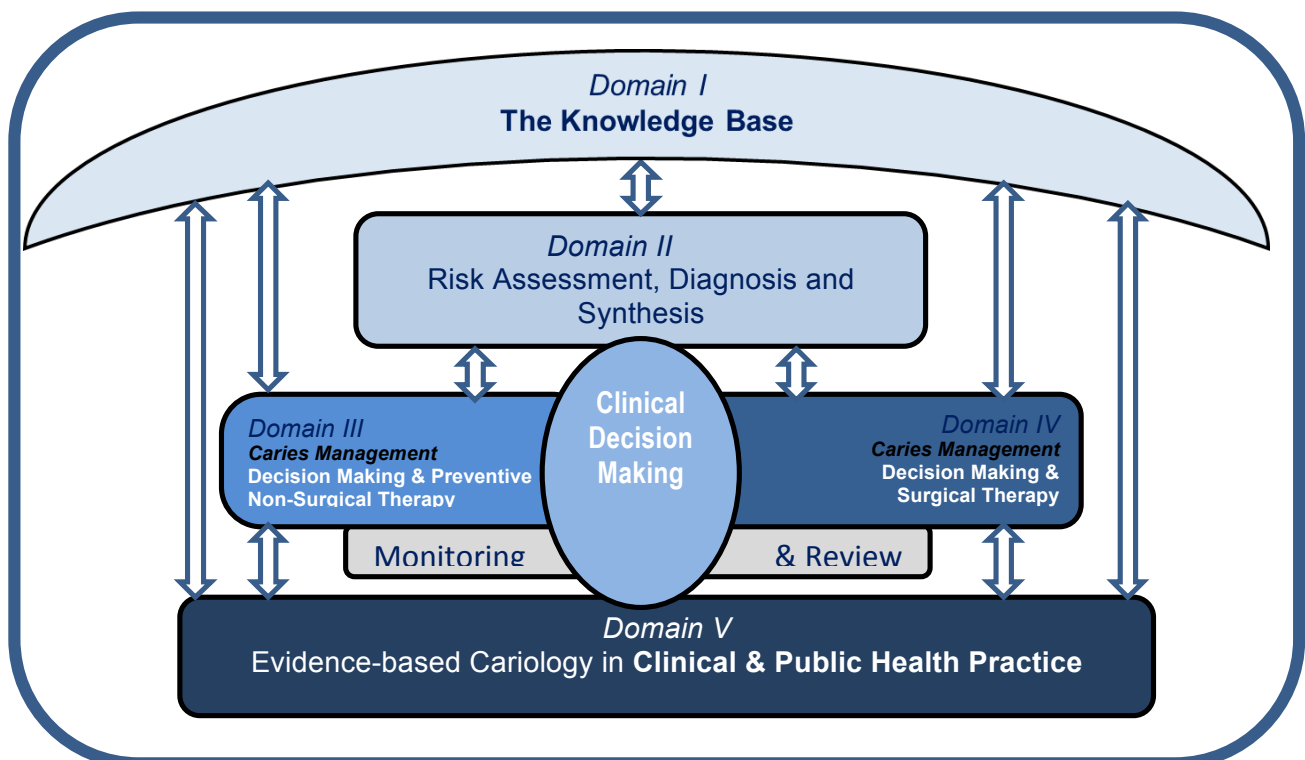


Fig. 1: Interrelationship of the five main domains representing the discipline of cariology

To describe the requirements in cariology for the graduating dentist the terms competences (Table 1), knowledge and familiarity have been used by adopting the definitions which were presented in the ADEE document “Profile and competences of a graduating European dentist - update 2009” (Cowpe et al. 2010). Nevertheless, this does not necessarily mean that for each domain all the three stages of requirement were identified.

Major Competences

Within each domain, at least one ‘major competence’ is identified as relating to that domain’s activity. A major competence is the ability of a dentist on graduation to perform or provide a particular, but complex, service or task. Its complexity suggests that multiple and more specific abilities (supporting competences) are required to support the performance of any major competence.

Supporting Competences

Specific abilities could be considered as subdivisions of a major competence and are termed a supporting competence. Achievement of a major competence requires the acquisition and demonstration of all supporting competences related to that particular service or task. However, some supporting competences may also contribute to the achievement of other major competences.

Table 1: Definitions of Major and Supporting Competences as presented by Cowpe et al. 2010.

The lists of supporting competences are not intended to be prescriptive and are by no means exhaustive. The lists are included for use by educators, individual schools or countries to complete and modify to meet particular national or regional needs. In making this subdivision into major and supporting competences, ORCA and ADEE envisage that all European schools will adhere to the major competences as described in this document, and acknowledge that supporting competences may vary in detail and style of implementation between schools (Cowpe et al. 2010).

It could be suggested that the supporting competences resemble what might be termed “learning outcomes”. However, the information in this document describes the professional qualifications of a European Dentist, not the requirements of a course or programme of

training. Having considered the definitions of competences and learning outcomes within the context of the Bologna Declaration, the term competences has been utilised. It is anticipated that the competence statements listed could support educational institutions in defining the learning outcomes, relevant to their curriculum that they would expect of a dentist on graduation. If the learning outcomes and the competency statements are in line with each other, the dentist would on graduation automatically fulfil the competency statements (Cowpe et al. 2010). *Learning outcomes support defined competences but are at a greater level of detail and form the basis of both learning and assessment. Properly constructed, competences and learning outcomes are precisely formulated to indicate what the students should know about, what the students should understand, and what the students should be able to do and how well, using language and context that indicates the level at which they will be assessed'* (European Journal of Dental Education 2008).

In this ORCA/ADEE document the definitions presented in Table 2 have been applied to the competences.

Be competent at: a dentist should on graduation demonstrate a sound theoretical knowledge and understanding of the subject together with an adequate clinical experience to be able to resolve clinical problems encountered independently or without assistance.

Have knowledge of: a dentist should on graduation demonstrate a sound theoretical knowledge and understanding of the subject, but may have only limited clinical/practical experience.

Be familiar with: a dentist should on graduation demonstrate a basic understanding of the subject but need not have clinical experience or be expected to carry out procedures independently.

Table 2: Definitions applied to the competences as presented by Cowpe et al. 2010.

The major competences described in the European Core Curriculum for Cariology mirror almost completely the seven domains described in the ADEE document "Profile and Competences for the Graduating European Dentist" (Cowpe et al. 2010). However, the domain conspicuous by its absence is that of professionalism. The reason for this is not that it was deemed unimportant, but rather that it was deemed too important, too all

encompassing to be divided into separate parts for cariology and other fields. A professional attitude and behaviour imply awareness of all skills needed for clinical dental practice and dental public health practice as well as of the dentist's responsibility to display and continuously develop those skills it includes a thorough understanding of, and application of their moral, ethical and legal responsibilities. It applies equally to the field of cariology as to any other part of dentistry.

The way cariology is taught varies widely on a global scale, and even within Europe differences in didactic and organisational approach are substantial. It is the aim of the European Core Curriculum for Cariology to provide a framework of content and goals, not to prescribe a specific way of implementation. Local differences in the organisation of higher education or oral care provision may result in specific choices, such as curricula where medical and dental students are taught together for some years, or curricula entirely based on Problem Based Learning. The survey among European dental schools showed that cariology is being taught in many different ways by many different units (Schulte et al. 2011). We hope that this new Core Curriculum for Cariology will be used, so that whatever organisational choices are made in the dental curriculum, the graduating dentist is equipped to provide appropriate care for the most widespread oral disease, caries.

Domain I: The Knowledge Base

This domain describes the foundation knowledge needed for the domains II to V. A varying depth of knowledge and understanding of each of the aspects of the knowledge base will be required in order to reach the appropriate competence levels.

Major competence:

On graduation a dentist must be competent at applying knowledge and understanding of the biological, medical, basic and applied clinical sciences in order to recognise caries and other dental hard tissue disorders and make decisions about their prevention and management in individuals and populations.

Supporting Competences

with regard to development, growth and structure of relevant oral tissues

on graduation, a dentist must:

have knowledge of :

1.1 normal development, growth and structure of the dental and oral tissues (for example dental hard tissues, pulp and salivary glands) at a macroscopic, microscopic and molecular level

be familiar with:

1.2 developmental disorders of the dental and oral tissues at a macroscopic, microscopic and molecular level

Supporting Competences

with regard to aetiology, pathogenesis and modifying factors of dental caries and other dental hard tissue disorders

on graduation, a dentist must:

be competent at:

1.3 describing and discussing the mechanisms and dynamic processes involved in maintaining a state of health, as well as the host response in caries, erosion and non-erosive wear at the macroscopic, microscopic and molecular level

have knowledge of:

1.4 the role of: oral biofilms; diet and nutrition; saliva and other host factors; fluoride; and behavioural / social factors related to caries and other dental hard tissue disorders.

1.5 biochemical events in the biofilm, in saliva and in dental hard tissues

1.6 acid and base production, buffering properties and the effects of saturation in saliva and biofilm

be familiar with:

1.7 the role of environmental factors, drugs and systemic diseases related to caries and other dental hard tissue disorders.

Supporting Competences

with regard to detection, assessment and diagnosis

on graduation, a dentist must:

have knowledge of:

1.8 the physical and biological basis of changes in dental hard tissues as related to detection and assessment of caries and other dental hard tissue disorders.

1.9 the physical and biological science of radiography as related to detection and assessment of caries and other dental hard tissue disorders, including safety issues.

1.10 the principles of evaluating the performance of diagnostic methods as applied to caries and other dental hard tissue disorders.

be familiar with:

1.11 the mode of action and limitations of emerging methods for detection, assessment and diagnosis of caries and other dental hard tissue disorders.

Supporting Competences

with regard to behavioural sciences

on graduation, a dentist must:

have knowledge of:

1.12 the behavioural sciences including the psychological and sociological principles underlying interpersonal skills, communication and behaviour modification.

Supporting Competences

with regard to prevention and management

on graduation, a dentist must:

have knowledge of:

1.13 the mode of action, composition, properties, limitations and side effects of commonly available materials, products and techniques for the preventive non-surgical and surgical management of dental caries and other dental hard tissue disorders, at individual, group and population levels.

be familiar with:

1.14 the theoretical basis of emerging strategies and materials for the prevention and management of dental caries and other dental hard tissue disorders.

Supporting Competences

with regard to epidemiology and research methodology

on graduation, a dentist must:

have knowledge of:

1.15 the basics of epidemiology.

1.16 the principles of risk assessment.

1.17 research methodology and its limitations, including study design, sampling, bias and statistics.

Domain II: Risk Assessment, Diagnosis and Synthesis

This domain represents a common bridge between the knowledge based and subsequent assessment as to the need for and choices from the increasing range of non-surgical and surgical management options for the prevention and control of dental caries. Competencies in both synthesis and clinical decision making are needed to make evidence-informed and appropriate decisions for clinical and public health practice.

Risk Assessment

Major Competence:

On graduation the dentist must be competent at identifying and estimating the probability for a patient of developing new caries lesions or progression of existing lesions during a specified period of time. The dentist must also be competent at applying these abilities with regard to erosion and non-erosive wear. A varying depth of knowledge and understanding is required in order to collect, record and analyse reliable, valid and clinically-meaningful data allowing the dentist to categorise patients into different risk categories for caries and, where applicable, for erosion and non-erosive wear.

Supporting Competences:

On graduation, a dentist must:

be competent at:

2.1 obtaining data by selecting the appropriate risk factors/indicators if/when applicable from: patient's histories comprising medical, oral, dental, social and economic aspects; oral health behaviours by taking into account oral hygiene, knowledge, preferences and self-efficacy, dietary habits and intraoral biological factors; caries experience; fluoride use; systemic health; and considering new validated risk factors, as new evidence emerges.

2.2 communicating the results of risk assessment with patients or others and providing recommendations to enable patients to reduce risk of developing new caries lesions and/or progression of existing lesions in the future – see Domains III and IV.

have knowledge of:

2.3 judging emerging information on risk factors and indicators.

There is often some confusion between the term *caries diagnosis*, *lesion detection* and *lesion assessment*.

Caries diagnosis should imply a human professional summation of all available data. *Lesion detection* implies some objective method of determining whether or not disease is present. *Lesion assessment* aims to characterize or monitor a lesion, once it has been detected.

Diagnosis

Major Competence:

On graduation the dentist must be competent at caries diagnosis through collecting, analysing and integrating data on signs and symptoms of dental caries and assess the activity status of a lesion on a tooth surface to arrive at an identification of past or present occurrence of the disease caries. A similar competence is required for diagnosis of erosion and non-erosive wear.

Supporting Competences:

On graduation, a dentist must:

be competent at:

2.4 recognising abnormal tooth tissue and differentiating between carious and non-carious hard tissue changes or anomalies. This should encompass primary and secondary lesions in both coronal and root surfaces.

2.5 collecting and recording data on the presence of *different stages* of the caries process (signs) and symptoms related to dental caries.

2.6 assessing *activity status* for different stages of the caries process

2.7 collecting, analysing and integrating data on signs and symptoms of erosion or non-erosive wear with activity status where appropriate, to arrive at a diagnosis of the different types of erosion or non-erosive wear.

have knowledge of:

2.8 evaluating different current and emerging methods for detection and staging the caries process and assessing activity of carious lesions and use such information to contribute to making informed treatment decisions (see also Domains III and IV)

2.9 evaluating different current and emerging methods for detection and staging of erosion or non-erosive wear and activity assessment of erosion or non-erosive wear

and how to use such information to contribute to making informed treatment decisions (see also Domains III and IV).

be familiar with:

2.10 the different types of developmental anomalies and the differentiation of these conditions from caries and erosion or non-erosive wear

Synthesis is an important step in ensuring that all the various strands of information obtained from histories, examinations and special investigations are drawn together in a systematic manner and integrated for the benefit of a specific patient at a specific time.

Synthesis

Major Competence:

For ensuring the appropriate, continuing management of dental caries and to enable patient-centred and shared clinical decision making, on graduation the dentist must be competent at synthesising all relevant information by combining and interpreting findings from: risk assessment and diagnostic processes; from patients' needs, preferences and best interests; and from monitoring, review and re-assessment findings, when available.

Supporting Competences:

On graduation, a dentist must:

be competent at:

2.11 eliciting and assessing patients' needs, preferences and best interests for the management of caries.

2.12 making clinical decisions incorporating, when appropriate, findings from monitoring, review and re-assessment of caries.

These aspects link to the clinical decision making aspects of Domains III and IV.

have knowledge of :

2.13 erosion and non-erosive wear, synthesising all relevant findings from histories and examinations by combining and interpreting them in order to enable patient-centred and shared clinical decision making.

2.14 eliciting and assessing patients' needs, preferences and best interests for the management of erosion and non-erosive wear

2.15 making clinical decisions incorporating, when appropriate, findings from monitoring, review and re-assessment of erosion and non-erosive wear

These aspects link to the clinical decision making aspects of Domains III and IV.

be familiar with :

2.16 treatment options, including when to refer for specialist medical and dental care, for other, rarer, disorders of dental hard tissues or medical illnesses causing dental hard tissue disorders.

DOMAIN III: Decision Making and Preventive Non-Surgical Therapy

This domain is concerned with the management of caries and other dental hard tissue disorders with an emphasis on long-term preventive care planning and maintenance. It involves applying the principles of prevention of dental hard tissue disease processes (primary prevention) and progression when it has manifested itself (secondary prevention). These competences apply in differing ways to patients of all ages. Goals of prevention should be clearly defined in order for outcomes to be evaluated.

Communication with Patient, Family and Community in Different Healthcare Environments

Major competence:

On graduation a dentist must be competent at communicating aspects of prevention effectively, interactively and reflectively with patients of all ages, their families and carers. The communication style has to consider the age and the social circumstances of the patient/community and the environment in which this is imparted. In the following section the term „patient“ also refers to families and carers where appropriate.

Supporting Competences

On graduation, a dentist must:

be competent at:

- 3.1 establishing a trusting patient – dentist relationship
- 3.2 identifying patient expectations, desires, attitudes, needs and demands when considering preventive treatment planning
- 3.3 identifying the psychological, physical and social factors that might have an influence on patient compliance and thereby on the outcome of preventive measures implemented and advised
- 3.4 involving the patient to promote their understanding of the disease and enhance cooperation in professional and individual preventive measures as a contribution to their future oral health.
- 3.5 obtaining informed consent for delivery of all aspects of preventive care
- 3.6 working with other members of the dental team and having a clear knowledge of their roles and responsibilities during individualised preventive care and maintenance.
- 3.7 appropriately sharing information and professional knowledge with other healthcare professionals and knowing when to refer high caries risk patients for secondary care.

have knowledge of:

- 3.8 behavioural factors that facilitate the delivery of preventive dental care
- 3.9 patient-related factors influencing the outcome of the communication of preventive advice e.g. expectations, compliance over time and manual dexterity
- 3.10 non verbal communication skills e.g. intonation, body language, sitting position, eye contact
- 3.11 behavioural interventions such as motivational interviewing
- 3.12 enabling the patient to recognize the association between oral and systemic diseases.

be familiar with:

- 3.13 culturally related differences in behaviour

Clinical Decision-Making leading to Preventive Non Surgical Therapy

Major Competence:

On graduation, the dentist must be competent at collecting, interpreting and synthesising all relevant information needed to formulate appropriate treatment options which can be presented to and discussed with the patient to arrive at a shared decision for an individualised treatment plan.

This includes a preventive care strategy according to needs, risks and compliance possibilities at the individual, family, group or community level. This non-surgical disease management should consider not only the site and tooth but also patient related factors. This requires an awareness of the potential to change and monitor risk over time. Furthermore, the graduating dentist must be competent at systematically evaluating all preventive treatment outcomes at recall and formulating alternative treatment plans when required.

Supporting competences:

On graduation, a dentist must:

be competent at:

- 3.14 decision-making based on the synthesis as described in Domain II

- 3.15 educating patients concerning the aetiology of dental hard tissue disease and encouraging them to assume responsibility for their oral health
- 3.16 educating patients concerning dietary habits relevant to oral health
- 3.17 teaching patients to perform appropriate oral hygiene measures
- 3.18 performing professional tooth cleaning
- 3.19 administering preventive agents (e.g. fluorides) appropriately
- 3.20 monitoring the effects of mechanical and chemical plaque control.
- 3.21 applying sealants
- 3.22 taking into account the needs of risk groups (e.g. aged or disabled or patients with systemic or psychiatric disease)

have knowledge of:

- 3.23 mechanisms of caries prevention agents, their methods of application and administration.
- 3.24 limitations and adverse effects of agents and products used in preventive care.
- 3.25 destructive and protective role of diet in caries and erosion.

be familiar with:

- 3.26 the critical appraisal of new developments and how to integrate them in his/her clinical activities

DOMAIN IV: Decision Making and Surgical Therapy

This domain is concerned with the management of caries and other dental hard tissue disorders with an emphasis on restorative care planning and maintenance, accompanied by continuing preventive care (see domain III). It involves applying the principles of preservation of dental hard tissues and is aligned with other aspects of restorative dentistry, endodontics and prosthodontics, as far as the execution of a restoration or a restorative treatment plan is concerned. It is recognised that the surgical intervention option is only considered when the prevention alone options are no longer likely to succeed.

Clinical Decision-Making leading to Surgical Therapy

Major competence:

On graduation, the dentist must be competent at collecting, interpreting and synthesising all relevant information needed to formulate appropriate treatment options which can be presented to and discussed with the patient to arrive at a shared decision for an individualised treatment plan.

This requires the ability to decide when it is appropriate for surgical intervention decisions for caries and other hard tissue disorders (e.g. erosion or non-erosive wear) to be made and understanding of the consequences and prognosis of such decisions.

Supporting competences:

On graduation, a dentist must:

be competent at:

- 4.1 selecting the appropriate treatment option based on a sound knowledge of the range of non-surgical and surgical treatment options available
- 4.2 recognising, understanding and managing the consequences of surgical intervention
- 4.3 continual reflection on the decision-making process and outcomes of surgical intervention

have knowledge of:

- 4.4 the reactions of the pulpo-dentinal complex to the caries process and to restorative procedures

be familiar with:

4.5 success and failure rates of restorations

Surgical Therapy

Major competence:

On graduation, a dentist must be competent at carrying out appropriate surgical treatment of caries whilst preserving tooth structure. The graduating dentist must be competent at restoring the loss of dental hard tissue in form, function and aesthetics and at the same time establishing and promoting oral health.

Supporting competences:

On graduation, a dentist must:

be competent at:

4.6 deciding when, how and to what extent to remove carious tissue before the placement of a restoration considering the restorability of the tooth, preservation of tooth structure and pulp vitality.

4.7 selecting and handling of appropriate restorative materials considering physical and chemical properties, biocompatibility and longevity

4.8 selecting and carrying out operative techniques appropriate for both material and case

have knowledge of:

4.9 the impact of restorative procedures on mucosa, periodontal tissues, occlusion and oral function

be familiar with:

4.10 a range of emerging methods for caries removal, comprising both identification/detection of what needs to be removed and the actual act of removal of carious tooth tissue

4.11 a range of restorative techniques and materials

4.12 biomechanics of restorations

Follow-up of Restorative Therapy

Major competence:

On graduation, a dentist must be competent at including in the decision for appropriate recall timing for the patient, the diagnosis of secondary caries and restorative failure. The graduating dentist must be competent at deciding on maintenance, repair or replacement of a restoration and at appropriate patient instruction in order to prevent damage of the restoration.

Supporting competences:

On graduation, a dentist must

have knowledge of:

4.13 assessment and monitoring of treatment outcome over time

4.14 maintenance of restorations in order to prolong longevity

be familiar with:

4.15 health economic aspects of restorative therapy

DOMAIN V: Evidence-based Cariology in Clinical and Public Health Practice

This domain deals with the core skills of evidence based dental practice within the undergraduate curriculum, which underpins the dual facets of clinical cariology (relating particularly to individuals) and public health cariology (relating particularly to groups/societies). It should be emphasised that public health cariology requires additional competences to those listed in domains II to IV. This domain relates to caries, dental erosion, non-erosive wear and other dental hard tissue disorders.

Core competencies in evidence-based dentistry, which are generic to the undergraduate curriculum as a whole and not only cariology, are integral to lifelong learning skills within dentistry. The clinical cariology competences in assessment and management of caries for the individual patient are dealt with within domains II to IV and for Public Health Cariology, the competences are presented within this domain in close relationship to the principles of evidence-based dentistry.

It is important that these topics are brought to life by including practical experiences within the clinical and public health environment.

Dental Public Health in relation to cariology

Major competence:

On graduation, a dentist must be competent at preventing and controlling dental caries and other dental hard tissue disorders at the group and community level. This requires comprehensive understanding of epidemiology, health promotion and preventive strategies, their integration in oral health care systems and interaction with other oral disorders, general health, nutrition and the socio-economic context.

Supporting competences:

On graduation, a dentist must:

be competent at:

- 5.1 delivering oral disease prevention for groups
- 5.2 assessing health-related behaviours and induce changes

have knowledge of:

- 5.3 managing issues related to individuals' rights and interests as well as to professionals' rights, duties and interests
- 5.4 recording caries and other dental hard tissue disorders using appropriate indices at different disease levels in a public health setting
- 5.5 the indices for different oral problems
- 5.6 the concept of oral health-related quality of life
- 5.7 the descriptive epidemiology of caries in relation to different background variables such as age, general health, socio-economic status etc.
- 5.8 the identification of caries risk individuals and groups in populations
- 5.9 the assessment of dental treatment needs from a public health perspective
- 5.10 the interaction of levels of organisation for prevention (individuals, groups, population)
- 5.11 the interactions between caries and other oral health problems
- 5.12 the organisation of dental health care and public dental health in home country
- 5.13 the role of different health professionals and their interaction in public dental health

be familiar with:

- 5.14 the application of epidemiological methods in dental public health
- 5.15 trends in dental health patterns and treatment needs
- 5.16 oral health promotion and prevention for populations as part of general health promotion
- 5.17 concepts of general public health approaches in populations
- 5.18 international approaches to dental healthcare systems
- 5.19 health economic aspects of oral health programs

Evidence-based Cariology

Major competence:

On graduation, a dentist must understand the benefits of practising in an evidence-based manner at both individual and public health levels, and have good knowledge and skills in these areas, and apply them to the fields of caries, dental erosion, non-erosive wear and other dental hard tissue disorders.

Supporting competences:

On graduation, the dentist must:

be competent at:

- 5.20 identifying uncertainty or gaps in understanding

- 5.21 formulating an answerable question and searching for evidence, using appropriate resources
- 5.22 searching for and using the most appropriate clinical guidelines
- 5.23 critical appraisal of evidence for diagnostic methods and therapies
- 5.24 evaluating the evidence for new treatment strategies in order to decide on their implementation
- 5.25 recognising the limitations of research methodology and guidelines

have knowledge of:

- 5.26 the principles of evidence based dentistry and the hierarchy of evidence
- 5.27 the methods of communicating evidence based dentistry to individuals, groups and populations
- 5.28 the advantages and disadvantages of guidelines
- 5.29 translating research findings into clinical and public health practice

Be familiar with:

- 5.30 the principles of research including study design, sampling, bias and biostatistics (related to Domain I)

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References

Cowpe J, Plasschaert A, Harzer W, Vinkka-Puhakka H. Profile and competences for the graduating European dentist – update 2009. *Eur J Dent Educ* 2010; 14: 193-202

European Academy for Pediatric Dentistry. A guideline framework for undergraduate education in pediatric dentistry. *Eur Arch Paediatr Dent* 2009; 10:114-119

European Society of Endodontology. Undergraduate curriculum guidelines for endodontology. *Int Endodont J* 2001; 34: 574–580.

Hicklin SP, Albrektsson T, Hämmerle CHF. Theoretical knowledge in implant dentistry for undergraduate students. *Eur J Dent Educ* 2009; 13 (Suppl. 1): 24–35

Kossioni A, Vanobbergen J, Newton J, Müller F, Heath R. European College of Gerodontology: undergraduate curriculum guidelines in gerodontology. *Gerodontology* 2009; 26: 165–171

Petersen PE, Bourgeois D, Ogawa H, Estupinan-Day S, Ndiaye C. The global burden of oral diseases and risks to oral health. *Bulletin of the World Health Organisation* 2005; 83:661-669.

Plasschaert AJM, Holbrook WP, Delap E, Martinez C, Walmsley AD. Profile and competences for the European dentist. *Eur J Dent Educ*. 2005; 9: 98–107.

Sanz M, Meyle J. Scope, competences, learning outcomes and methods of periodontal education within the undergraduate dental curriculum: A Consensus report of the 1st European workshop on periodontal education – position paper 2 and consensus view 2. *Eur J Dent Educ* 2010; 14 (Suppl. 1): 25–33

Schulte A, Buchalla W, Huysmans MC, Amaechi B, Sampaio F, Vougiouklakis G, Pitts NB: A survey on dental education in cariology for undergraduate students in Europe. *Eur J Dent Educ* (in preparation).